

## **ABSTRACT**

5 A device for adsorbing water vapor from a gas stream. The device can be incorporated with an enclosure or garment in such a manner so as to enable water vapor to be adsorbed, thereby decreasing the relative humidity in the micro-climate surrounding the user. The water adsorption device is light-weight, has a high mass and volumetric energy capacity. A desiccant material is included within the water adsorption device to adsorb water vapor and a phase-change material is located in thermal communication with the desiccant to increase the loading capacity of the desiccant and maintain a cool gas stream by extracting the heat of adsorption from the desiccant.